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I, JANENE PEISKER, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004901265 for a patent by RAYMOND RABANIN as filed on 12 March 2004.

WITNESS my hand this
Eighteenth day of April 2005

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COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1990

PROVISIONAL SPECIFICATION

Title: Collar Assembly

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Application Date: 12 March 2004

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COLLAR ASSEMBLY

FIELD OF THE INVENTION

This invention relates to a collar assembly for use on structures containing elongate elements in particular tubes or pipes. The collar assembly is quickly and easily securable to such an element and may be incorporated in an item to be connected to the element or may provide a support or connection point for securing an item on or to the element. It is particularly directed to use on scaffolding and other structures formed from tubing.

BACKGROUND

It is often required to make a physical connection to a structure that includes an elongate element such as a pipe or tube. As an example, scaffold structures are temporarily erected on buildings and other structures under construction or repair to provide workers with access to working areas not otherwise reachable, for example due to their height. Most scaffolding structures are assembled from lengths of tubing connected to each other by specialized clamps.

For safety, it is recognized as highly desirable to secure electric cables, hoses and the like in positions that will prevent them from posing tripping hazards on walkways of scaffold structures. It is possible to tie such items to the scaffold structure, but this approach can be slow and of uncertain reliability. Moreover, as the work advances or as different trades require changes to the runs of hoses and cables, they may need to be secured in new positions. It is desirable that this be able to be done easily and quickly.

The present invention provides a collar assembly, and a cable support incorporating the collar assembly, that can in many cases meet such requirements. While the invention is particularly directed to providing support for cables hoses and the like on scaffold structures, embodiments can be used also to provide support for junction boxes, signs, lighting, temporary barriers and virtually anything that needs to be anchored on the scaffold structure.

Moreover, the invention is believed also to have applications to other structures formed of elongate elements, such as temporary fencing.

SUMMARY OF THE INVENTION

In a first aspect, the invention provides a collar assembly adapted to surround and grip an elongate element the collar assembly including first and second parts engageable with each other by first positioning the parts adjacent to the elongate element and subsequently moving one of the parts relative to the other part in substantially an axial direction and into engagement with the other part,

wherein the first and second parts have first and second surfaces respectively that are inclined to the axial direction and that during engagement of the first and second parts slide against each other thereby to generate relative movement of the first and second parts in a plane normal to the axial direction so that the collar assembly is tightened around said elongate element.

This invention enables a collar assembly to be provided that is securable firmly by frictional means to an elongate element such as a tube or pipe, without the need for access to the end of the elongate element. The collar assembly can provide for rapid assembly in place on the elongate element, and for rapid disassembly when required.

The collar assembly may include one or more attachment formations or fitting for securing items in position relative to the elongate element.

In a preferred embodiment, the first part has an axially extending wedge formation the wedge formation having a thickness that increases in the axial direction; the second part has an axially extending formation of channel-shaped cross-section the channel shaped cross-section having a recess of a width that increases in the axial direction, and the first and second surfaces of the first and second parts are respectively surfaces of the wedge and the recess. Preferably, the wedge formation is outwardly protruding and the recess is inwardly facing to receive the wedge formation in use.

It is particularly preferred that the formation of channel-shaped cross-section is one of two such formations included in the collar assembly and that the wedge is one of two such wedges included in the collar assembly, each formation of channel-shaped cross-section in use of the collar assembly receiving one of the two wedges.

At least one of the first and second parts may have a shaped surface that when said collar assembly is assembled to the elongate element conformingly abuts an external surface of the elongate element. In particular, the or each shaped surface may be part-cylindrical in shape so that the collar assembly is adapted to surround and grip an elongate element of substantially circular cross-section. Scaffolding structures in practice are erected using lengths of circular cross-section tube or pipe.

Where the first and second parts are shaped to grip and surround an elongate element of circular cross-section, the two wedges are preferably at least approximately diametrically opposed to each other.

In another aspect, the invention provides a collar assembly for surrounding and gripping an element that is elongate in an axial direction, the collar assembly including first and second collar segments that in use are secured to each other and each bear against the element around a part of the periphery thereof, wherein in use the collar segments are engageable with each other and around the element by relative sliding movement in the axial direction.

Preferably, the first and second parts of the collar assembly are integrally formed, for example, as injection mouldings of any suitable plastics material. The first and second parts may be kept in association when not in use by provision of a third part that connects the first and second parts. This may be, for example, a length of flexible cord secured to each of the first and second parts.

The invention further provides an equipment support for use on structures that include elongate elements, the support including a collar assembly in any of the forms disclosed herein and adapted for use with the elongate elements and having on either or both of the first and second parts a formation adapted for supporting one or more items of equipment.

In a particularly preferred embodiment of the invention, there is provided a cable support for use on scaffold tubes including a collar assembly in any of the forms disclosed herein and adapted for use on the scaffold tubes and having on the first or second part one or more formations adapted to support cables.

For example, the cable support may have on at least one of the first and second parts a plurality of fingers shaped and positioned to retain cables between adjacent fingers. Conveniently, the fingers may be spaced apart in the axial direction.

It will be apparent that wherever it is required to make a mechanical connection to an elongate element, for supporting an item thereon or for connecting an item thereto, the present invention may provide a useful choice, particularly where the mechanical connection is to be rapidly assembled and/or temporary in nature.

Accordingly, in a further aspect, the invention provides a connector for connecting a plurality of elements of which at least one element is elongate, the connector including firstly a collar assembly in any one of the forms disclosed herein for securing to the at least one element and secondly holding means secured to or included in the first or second part of the collar assembly and adapted to hold another of the elements.

Although mainly directed to assemblies and connectors that are able to be disassembled, the first and second parts may also be left permanently connected after assembly, for example by adhesive (including solvent adhesive) or by providing one or more cooperating ratchet-like teeth on (for example) the first and second surfaces.

In order that the invention can be better understood it will now be described non-limitingly by reference to preferred embodiments as shown in the attached Figures, of which:

Figure 1 is a perspective view of a collar assembly, configured as a cable support, according to the invention;

Figure 2 is a perspective view of the collar assembly shown in Figure 1, in use as a cable support;

Figure 3 is a perspective view of a first part of the collarassembly shown in Figure 1;

Figure 4 is a perspective view of a second part of the collar assembly shown in Figure 1;

Figure 5 is a cross-sectional view of the collar assembly of Figure 1 taken at station "AA", with tube 2 omitted;

Figure 6 is a side view of a connector including collar assemblies according to the invention, the connector itself according with one aspect of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

Figure 1 shows a collar assembly 1 according to the invention, secured to a tube 2 (shown in phantom lines) such as might be found in a scaffold or temporary fence structure. The collar assembly 1 is secured (by means set out below) to tube 2, and has formations 5 (see below) for supporting cables. It is to be understood, however, that a collar assembly such as collar assembly 1 may be applied to the support or connection of equipment or items other than cables in scaffolding and like applications.

Collar assembly 1 has first and second parts 3 and 4 respectively that when assembled together form the collar assembly 1. First part 3 includes eight fingers 5 spaced apart along, and extending outwardly from, a half-cylinder 6.

Figure 2 shows collar assembly 1 in use to support two electric power cables 7. Collar assembly 1 can support up to seven cables 7 if all eight fingers 5 are used, each cable being retained between two of the fingers 5. Each finger 5 includes an integral formation 8 at its free end so shaped that the distance between formations 8 of each adjacent pair of fingers 5 is slightly less than the distance between those fingers 5 themselves at points thereon closer to half-cylinder 6, so that once placed between a pair of fingers 5, a cable 7 is retained there. The fingers 5 are somewhat flexible and resilient due to a suitable choice of dimensions and material, and suitably spaced, so as to grip and retain cables 7 securely, while still allowing a cable 7 to be simply pulled away from the half-cylinder 6, and so released from collar assembly 1, when required.

Half-cylinder 6 has a half-cylindrical concave surface 8 that in use of collar assembly 1 as shown in Figures 1 and 2 lies conformingly against the cylindrical outer surface 9 of tube 2.

Figure 3 shows first part 3 alone, and in this Figure can best be seen elongate wedges 10 that protrude from half-cylinder 6 and extend along the length of half-cylinder 6 along its opposite edges. Wedges 10 increase

progressively in thickness along the length of half-cylinder 6, both having their maximum thickness at the same end of half-cylinder 6.

Figure 4 shows second part 4 alone. Second part 4 includes a part-cylindrical section 11 having a concave surface 12 that in use of collar assembly 1 (as shown in Figures 1 and 2) lies conformingly against the outer surface 9 of tube 2.

Extending along, and integral with, edges 13 of the part-cylindrical section 11 are elongate formations 14. As can be seen in Figure 5, each of formations 14 is channel-shaped in cross-section, with a recess 15 extending along its length and sized and oriented to receive therein one of the wedges 10 of first part 3. The dimension "x" (see Figure 5) of each of the recesses 15 varies progressively along the recess's length, each in the same direction so that the largest value of "x" is at the same end of each recess 15.

Collar assembly 1 can be assembled and secured to tube 2 in the following manner. First part 3 is placed against tube 2, in any desired position therealong, with concave surface 18 lying conformably against outer surface 9 of tube 2. Next, second part 4 is moved towards first part 3 from the opposite side of tube 2, in such an orientation that the thinner ends of wedges 10 are positioned to enter the thicker ends of recesses 15. Finally, second part 4 is moved lengthwise along the tube 2 and further into engagement with first part 3. Parts 3 and 4 are pulled inward toward tube 2 by the sliding of inclined surface 20 of wedges 10 against the inclined surfaces 21 of part 4 within recesses 15. This process continues until until wedges 10 are firmly gripped in recesses 15. At this point, the surfaces 18 and 12 of parts 3 and 4 respectively lie conformably against outer surface 9 of tube 2, and collar assembly 1 is assembled and securely held to tube 2. The collar assembly 1 is then ready for use.

Of course, either the first half 3 or the second half 4 may be positioned first, and either or both may be moved longitudinally to complete the above procedure.

The collar assembly 1 lends itself well to manufacture by injection moulding in suitably-selected plastics materials.

Variations in design may be made. For example, although the wedges 10 and formations 14 of collar assembly 1 are shown as being approximately

diametrically opposite, different positions may be chosen. For example (although not shown) if part 3 extended peripherally further around tube 2 and part 4 correspondingly less further around tube 2, part 3 could be made to clip on to tube 2, with part 4 then being assembled to part 3 to complete the collar assembly and tighten its gripping action on tube 2.

The principle of collar assembly 1 is not limited to the particular application of a cable support as described above. As a further example of its possible use, Figure 6 shows a connector 100 that includes two collar assemblies 101. Each assembly 101 is similar to cable support 1, described above, in having two halves 103 and 104 corresponding to parts 3 and 4 of assembly 1, but differs in not having the fingers 5. Instead, formations 106 integrally formed as part of parts 104 abut at faces 107 and are held together by a pin or bolt (not shown) that extends along an axis 108. Connector 100 connects two tubes 109 that are shown at right angles to each other but that could be at some other angle if required, each assembly 101 pivoting about the bolt/pin to assume the appropriate angle. Each assembly 101 is secured around its associated tube 109 in the same way as cable support 1 is secured to tube 2. A connector such as connector 100 could find many applications, such as connecting temporary fence modules that incorporate tubular elements, connecting parts of lightweight temporary structures (eg portable display stands) or even in furniture.

Many items that are to be secured to elongate elements such as junction boxes, light fittings and the like (not shown) may have one of the parts (i.e. corresponding to parts 3 or 4) of a collar assembly on the principle of collar assembly 1 incorporated into them, the other part then being assembled thereto.

As will readily be apparent, many other variations may be made without departing from the spirit or scope of the present invention.

Dated this 12th day of March 2004
M & R Group Pty Ltd
By their Patent Attorneys,
David Shanks & Associates

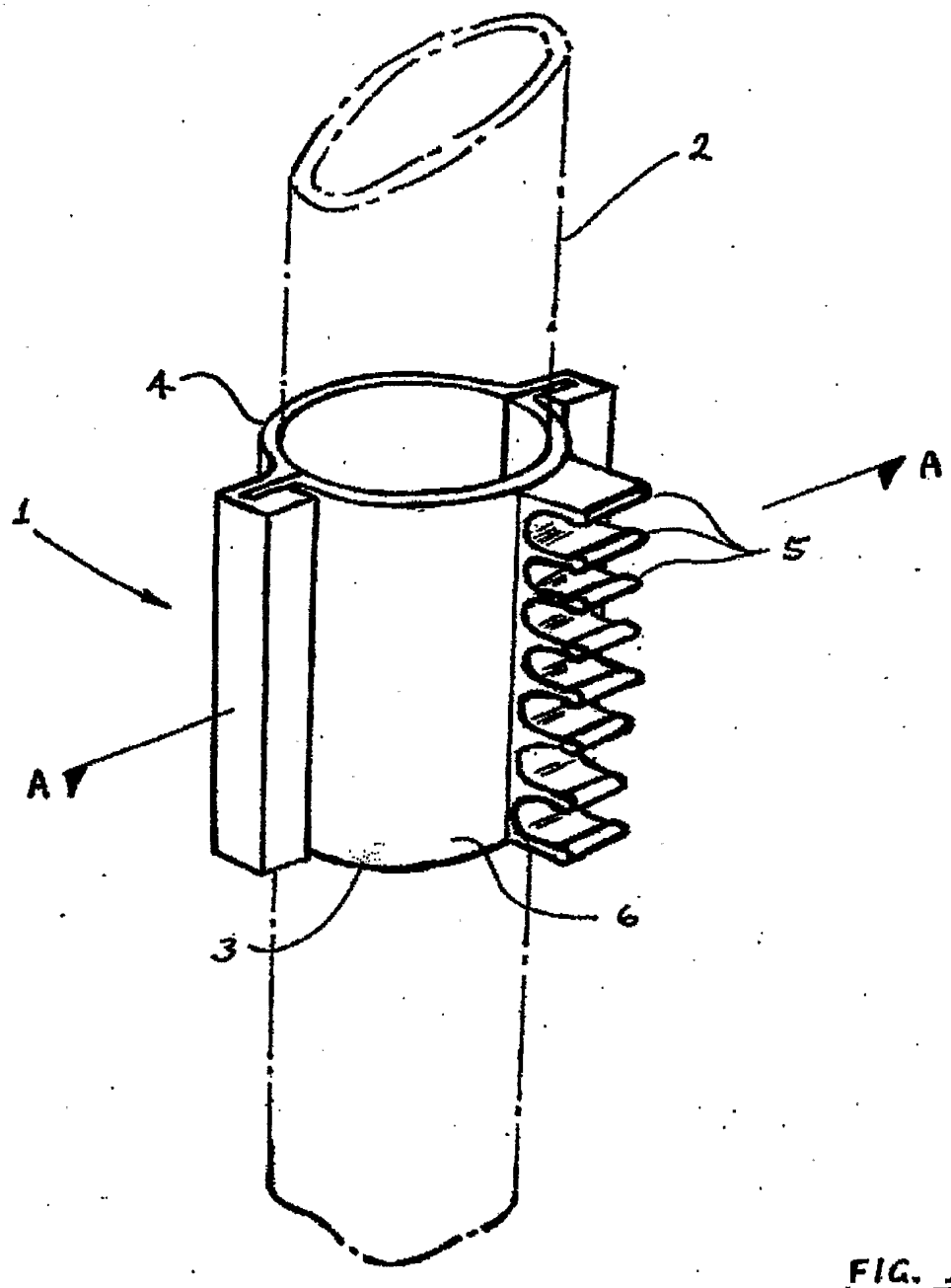

FIG. 1

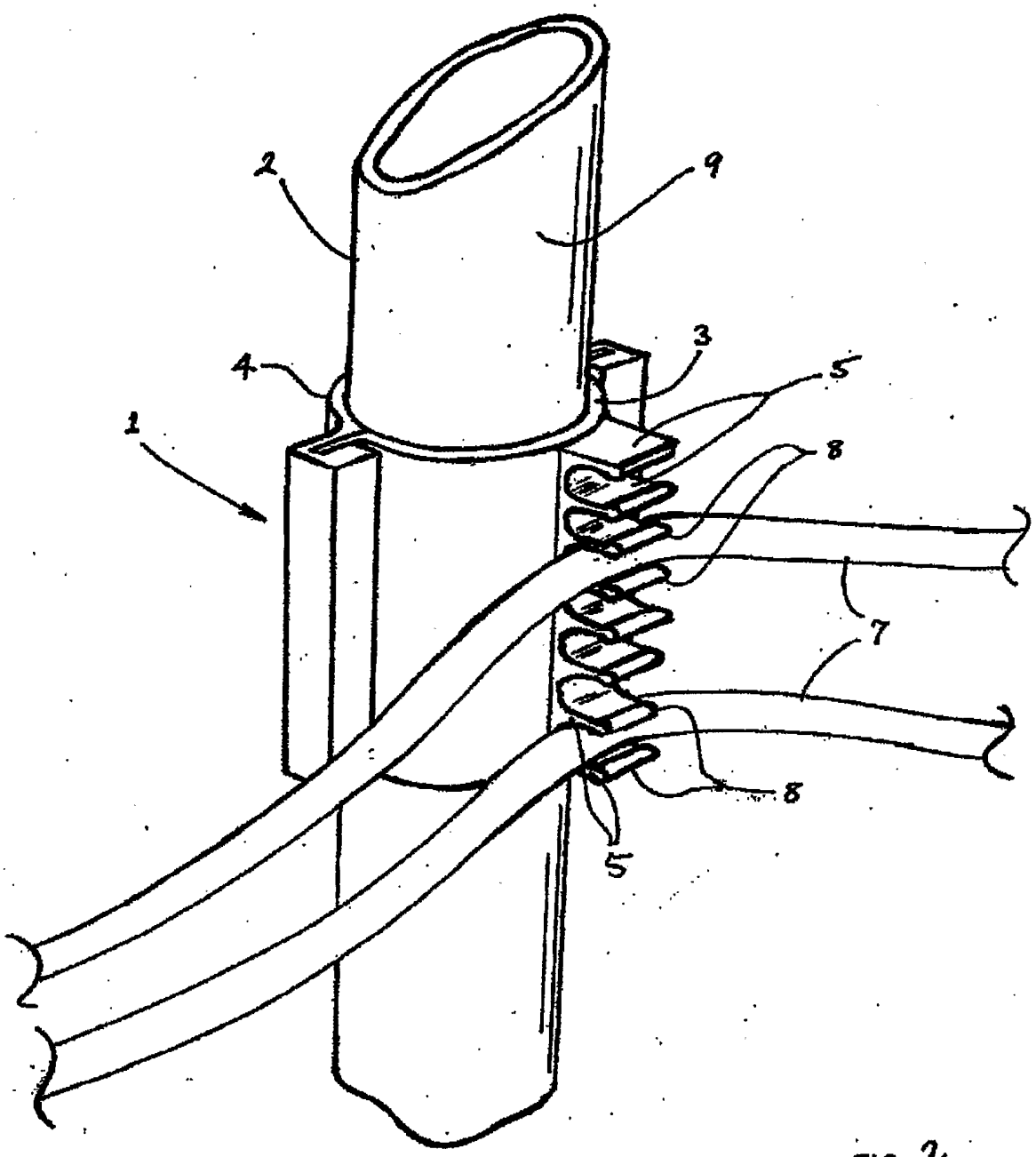

FIG. 2

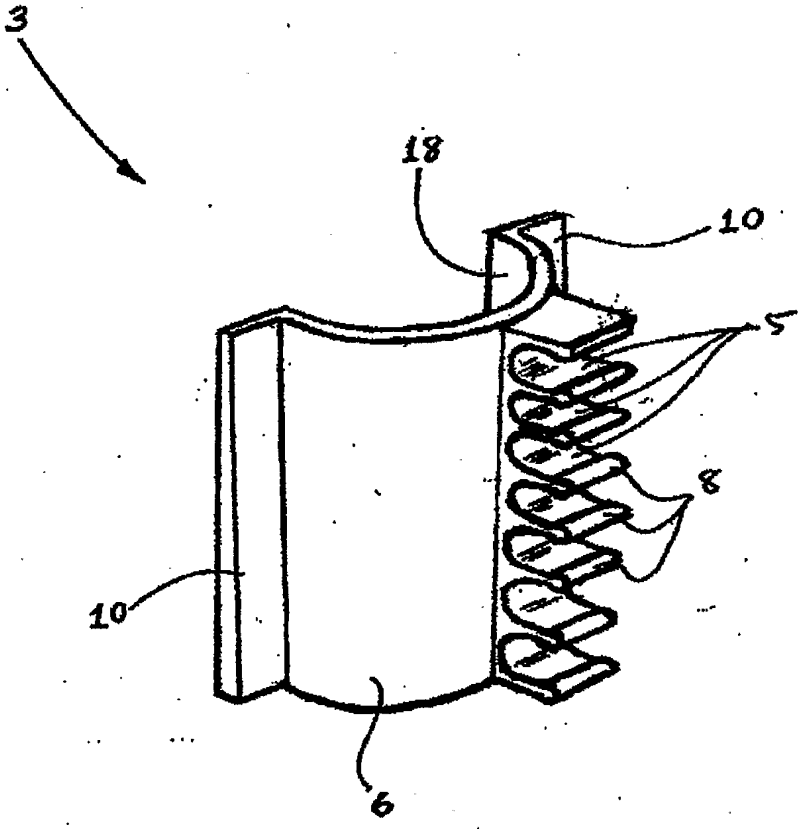

FIG. 3

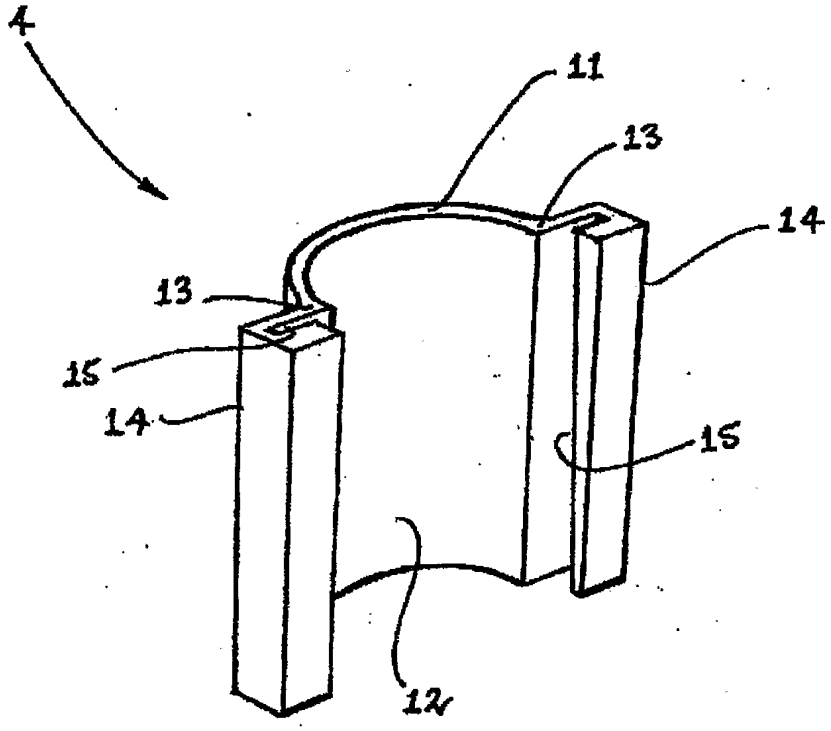

FIG. 4

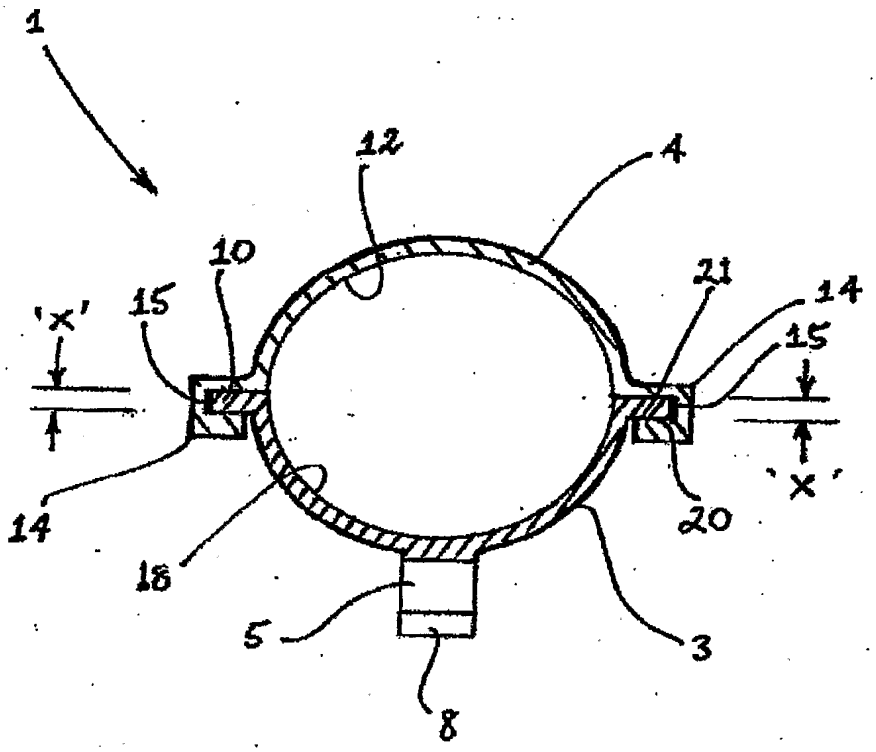

FIG. 5

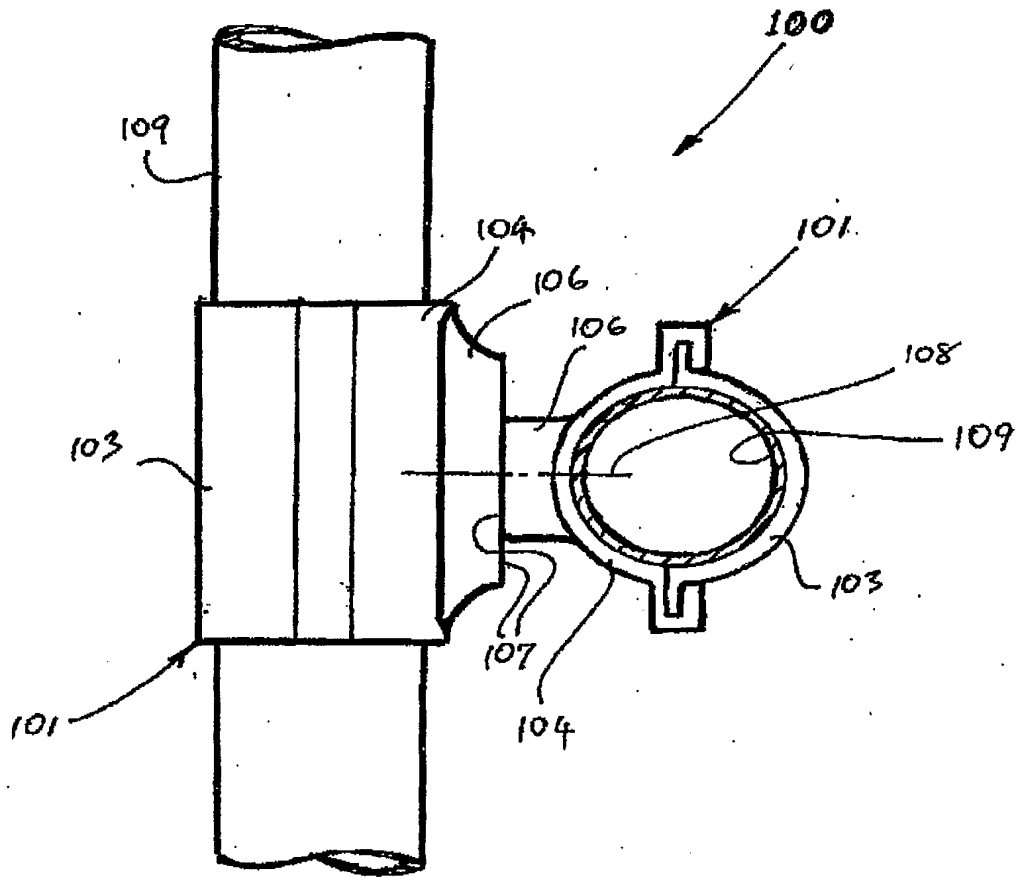

FIG. 6